

INTERNATIONAL CITY MANAGERS' ASSOCIATION

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MUNICIPAL WORK SIMPLIFICATION

What is work simplification? What are the municipal functions to which it can be applied? What steps should be followed in adopting a work simplification program?

Work simplification, or methods improvement, is a technique for improving job procedures by identifying and eliminating waste of time, equipment, material, space, and human effort. In its simplest application it is the urge of virtually everyone who works, regardless of his position, to make his job more productive with less effort. More formally, work simplification is the general term applied to any systematic attempt to discover a more economical way of performing a task or getting work done. "Organized application of common sense" is a key element in the process, and supervisors are the key people.

Elementary methods improvement comes naturally to many of the people who work. But like other phases of work in this age of specialization, the logical steps for improving production while reducing effort and cost have been formalized into a set of principles and techniques that can be taught and learned. The methods are directed principally to supervisors, and applications to municipal work are limited only by the imagination and vision of those who follow them. Purchasing, stock control, licensing, and tax billing; janitorial service, central garage operation, garbage collection, or street cleaning; office layout, records retention, duplicating services, and mail and messenger service -- these functions illustrate the scope of activities to which work simplification can be applied. The methods can be utilized as easily and profitably by small cities and on small operations as by large cities on sizeable operations.

Work simplification involves a review of the present way of doing things, a check as to why it is done that way, and finally, a decision either that the current method can be improved or that it is the best that can be devised at present. Officials may reasonably ask how, on top of everything else that employees and supervisors are expected to know and do, they can be made work simplification-conscious -- and why they should be. First, the natural inclinations are frequently present to be encouraged; second, the techniques can be readily taught in brief training courses; third, methods improvement should always effect worthwhile economies and will often benefit employee morale.

An approach to work simplification can be readily developed within existing organizations, with some outside help. In the beginning each supervisor should be trained in the methods involved. Management policy should then encourage him to evaluate his unit in terms of the simplest and most economical means of accomplishment. Ultimately, he should convey the methods and attitude to his associates, formally through training or informally through individual and group conferences. To provide the initial supervisory training, city officials may turn first to their state board for vocational education, second to their state university, and third to private management consulting firms.

For example, the college of business administration at the University of Illinois maintains a special business management service whose staff is equipped to render basic assistance in establishing work simplification programs, and formal on-the-job training courses can be provided for supervisors through the university extension division. Similar facilities exist at other state universities. There are also many firms and individuals, principally in large cities, who are engaged in management consultation and may be qualified to assist city officials with work simplification training programs.

Training films and filmstrips can be obtained from university and private film libraries and special sources listed in the bibliography at the end of this report. To supplement training, city officials may provide a modest library for supervisors to use. Some suggested titles are listed in the bibliography. Work simplification programs can be kept active by periodic conferences between the chief executive and his department heads and between department heads and their associates. It is thus possible for any city to carry on work simplification to some extent.

Some organizations should find it feasible to designate one or more members for special training. Local industries may cooperate in this respect by permitting city employees to participate in their work simplification training sessions; and university courses are available for individuals who can be spared from their jobs long enough to attend (possibly a semester or quarter). Larger cities have found it essential to establish staff departments or sections sponsoring work simplification training as part of a well-organized management research program. This staff unit, or the small city individual who is given methods improvement responsibility, should undertake a two-fold program of (1) making or preparing work simplification studies and coordinating work simplification programs, and (2) training and assisting supervisors to make continuing studies of their own operations.

Kansas City, Mo., and Long Beach, Calif., provide illustrations of two methods of organization. In Kansas City primary responsibility for work simplification has been assigned to the research and budget department, a staff agency whose director reports to the city manager. Members of this department receive both on-the-job coaching in work simplification techniques and formal instruction in a training course developed and taught by a senior staff member. Approximately half the staff has completed a time-and-motion study course offered locally by a qualified industrial engineer.

In Long Beach the work simplification activity has been established as a part of the budget and management research division of the finance department rather than as a separate department reporting to the city manager. An outside consultant conducts the training of supervisors. This kind of organization is similar to that found frequently in general business in which supervisors individually carry the main responsibility, with guidance or assistance from the staff section. The Kansas City organization is common in industrial concerns, where methods improvement is the job of specialists. Each has advantages, but the Long Beach method will very likely be more readily adopted by small cities and those in which supervisors are given a high degree of responsibility and autonomy.

No organization is too small to benefit from periodic study and improvement based on work simplification principles, nor to have an employee in the organization reasonably familiar with the methods of study and training. In small cities

the "specialist" may be an administrative assistant or some other employee who combines work simplification with other administrative aid functions such as those related to finance and budgeting and who obtains specialized assistance from a nearby university or a qualified consultant. In general, the primary emphasis in work simplification should be on its application by supervisors.

Success of the work simplification program will be directly related to the amount of support given it by the chief administrator. Improvement means change and frequently change in the method or location of work. Employees will be more receptive to change if they know the program is desired by the supervisory organization, right up to the city manager or mayor. Lacking this whole-hearted support, improvements may become lost in a maze of delay, debate, and active or passive resistance.

Basic Principles Of Work Simplification

There are four fundamental principles in simplifying work, applicable in any size of city: activities should be (1) productive; (2) arranged to provide a smooth flow of work and a balanced workload; and (3) kept as simple as possible. Fourth, active participation by all personnel involved in a methods improvement project is essential for its success. Each of these basic principles plays a part in every work simplification study. Omission of even one of them is likely to result in an unsatisfactory result.

1. Activities should be productive. "Productive" means contributing directly to the desired end result. Nonproductive elements should be reduced to the minimum. In almost every city, operations that are absolutely unnecessary are performed day after day. There are several reasons for this. Those responsible for originally planning the work were no more infallible than other men. In the judgment of a certain supervisor, an operation may have seemed necessary and he ordered it performed. Regardless of the soundness of his judgment at the time, the operation will continue to be performed until it is questioned and proved to be unnecessary.

A job may run smoothly for a number of years before a difficulty is encountered. Because the difficulty must be overcome quickly, it may be easier to add an operation than to seek out and remove the cause. The extra operation rapidly becomes a part of the job routine and remains long after its cause disappears or is corrected. Job instructions passed from an employee to his successor may be incomplete, causing the new employee to improvise and possibly to use several operations where one sufficed before. Searching analysis reveals these unnecessary, nonproductive elements of a job, and it is this kind of analysis which supervisors should be encouraged to employ.

2. Activities should be arranged to provide a smooth flow of work and a balanced workload. This means that essential work should be done in an orderly and logical sequence, and that bottlenecks, backtracking, and unnecessary delays should be eliminated. Frequently, when an existing sequence of work is reviewed critically, it is found not the best possible sequence. Unnecessary work is therefore being performed.

"Balanced workload" requires that each worker be given an optimum amount of work to do, neither more nor less than he can handle comfortably in the time allotted. It has been demonstrated that an employee facing an unduly heavy work-

load becomes distracted, worries about getting the work out, and his production suffers. Likewise, the average worker is happier when moderately busy than when searching for work. Keeping this balance is primarily a supervisory responsibility, and familiarity with work simplification methods makes it easier for the supervisor to see inequities.

3. Activities should be kept as simple as possible. Curtailment of extra steps, reducing a job to its barest essentials, makes it easier to perform, to teach, and to supervise. Savings in time and human effort should result inevitably when this can be done, and there may be concurrent savings in equipment, materials, or space. Work simplification techniques enable a supervisor to recognize easier ways of accomplishing tasks that are currently done the hard way, and to train his associates for similar recognition. Methods improvement should foster better quality as well as improved production.

4. Active participation by all personnel concerned is essential for the success of a work simplification project. Work simplification is not alone a management program, nor a supervisors' program. Instead, it is a team program that depends upon the participation of all segments of the organization. A worker, to be at ease, must be convinced that the better and easier way of doing a job is, in fact, a better and easier way for him. Otherwise it is not the best way. Before accepting a new method, the worker must either participate in developing the better and easier way, which in itself practically assures acceptance, or he must be sold by the person who developed the new method. Considering all factors, participation is preferable to salesmanship in work simplification.

An order to change work methods, issued from the top without consultation or with insufficient consultation of those affected, may be inferred as personal criticism and result in resentment and opposition. While work simplification deals with methods, it is people who employ the methods and their good will -- as well as their ideas -- is a valuable element in the methods improvement program.

Resistance to job method changes may be occasioned by fear that the proposed improvement will jeopardize security as represented by current status, income, and tenure. To forestall this kind of resistance, those responsible for work simplification should use every occasion to point out its probable present and future values in terms of individual status, income, and tenure. They should solicit suggestions and encourage full participation by the employees who will be affected by possible improvements.

Kansas City, and Danville and Martinsville, Va., are among the cities that use training to foster line participation in methods improvement. In Kansas City a ten-hour work simplification training course for supervisors has been developed and conducted by the research and budget department (see "How To Improve Work Methods" in Public Management for January, 1953). Materials presented in this course equip the supervisor for full participation in studies of his own operations; they also pave the way for the work simplification specialist from the research and budget department to conduct his own investigations without meeting resistance. In Danville and Martinsville two sessions of a 16-session course in supervisory techniques were devoted to methods improvement. In one session the method followed in improving garbage collection service by work simplification analysis was thoroughly discussed.

Methods of Work Simplification

Work simplification studies can be divided into six stages or phases: (1) defining the objective, (2) preparing the personnel, (3) gathering and organizing the facts, (4) analyzing and improving the procedure, (5) preparing recommendations and obtaining approval, and (6) installing, following up, and adjusting. These steps overlap in many situations but the personnel concerned with methods improvement should make sure that every step is covered in every project. Operations involving only one or two people may be treated with complete informality; but in large, complex jobs it will be desirable to outline and schedule each step in order to establish the cost of study and change in relation to anticipated savings.

For example, in proposing to simplify water billing operations, the manager of a small midwestern city merely discussed the possibilities with his meter reader and billing clerk over a period of time and ultimately developed a very successful change; whereas, in a large city the work simplification specialist was called on to conduct an intensive investigation using work distribution, flow, organization, and process charts that are the tools of the formal methods improvement process.

1. Defining the Objective.

This is the first step in any work simplification study and the foundation upon which the remainder of the study will be based. In defining the objective the supervisor must determine in the following order: (a) the problem to be solved; (b) the desired result of the procedure being studied (if the need for a particular form, report, operation or file cannot be established, it may be possible to eliminate the entire procedure at this stage); and (c) the objective of the study, stated in broad terms. This step serves the two-fold purpose of limiting the survey to the particular problem that has been causing trouble and of establishing the importance of the procedures involved in the job. It guides the supervisor in budgeting the time he can devote to the project and discourages exploration along trails leading away from the major problem.

2. Preparing the Personnel.

The supervisor should conduct his study openly and offer simple explanations of his aims and methods. He should solicit comments, ideas, and recommendations from clerks, laborers, and others who have been working with the current procedure for years. They frequently have sound ideas for its improvement and will welcome an opportunity to present them. Every avenue of communication with employees must be exploited to keep them informed of plans and progress. In large agencies, informal meetings can be held with employees in units to be studied. Here, the department head and the city manager can explain that the operation has been selected for study.

If a consultant is engaged to make a survey and recommendations, it should be pointed out that he is to assist in making improvements which the employees would make themselves if they were not so busy with their regular tasks; that when the project is completed they should find their work easier and without the old bottlenecks and widely varying workloads; and finally, that none of them will lose their jobs as a result of the work simplification study. These meetings may be repeated periodically to report progress, to discuss study findings and recommendations, to prepare for the installation of the new, improved procedure, and to evaluate the operation of the final procedure.

3. Gathering and Organizing the Facts.

A work simplification study cannot be based on rumor, opinion, or partial facts. To gather the facts means to obtain all of the facts pertaining to the operation being studied. When a supervisor does this on a job with which he considers himself very familiar he needs to take special precautions to see the actualities rather than what he may have come, through habit, to believe them to be. For example, he will need to determine how the work is received, quantities involved, what has been done to it before it arrives, whether the work is done at one place, who does it, what kind of equipment is used, and what other work the employee does. In gathering facts, the supervisor must answer the "Big Six" about every operation: what, why, where, when, who, and how? Kipling called these his "six honest serving men" and they taught him all he knew.

Numerous charts have been developed to assist in gathering and organizing facts for work simplification. Charts are used because they show clearly and objectively what would require almost unlimited words to describe. Several of these charts are discussed briefly below. Additional information about these and other aids can be found in the references listed at the end of this report, such as the Kansas City manual, "Municipal Work Simplification," by Graham Watt or "Putting Work Simplification to Work," by H. S. Hall (Business Management Service, University of Illinois, Urbana).

The work distribution chart. The first chart developed for methods improvement analysis is the work distribution chart. This shows in one place all of the activities of a unit and the contribution of each employee to each activity. It also shows how much time is spent on everything that is done by the unit. Study of this chart will enable a supervisor to determine the activities which should be given priority for work simplification analysis.

To prepare a work distribution chart, the supervisor must first obtain an "activity list" -- a statement of the activities or functions of his unit -- and individual "task lists," lists of each employee's individual tasks and the estimated number of hours spent per week on each. Activity lists are usually prepared by the supervisor himself. Task lists are prepared by individual employees and may be reviewed by the supervisor for accuracy and completeness. The task list, activity list, and work distribution chart are illustrated on the next page. When man-hours listed in the work distribution chart are totaled horizontally for each activity, and vertically for each employee and all activities, the chart provides a clear and complete picture of the work of the unit.

The organization chart. Another chart used in work simplification is the organization chart. This is a graphic representation of the arrangement and relationships of the subdivisions of an organization as they currently exist. These charts help to disclose organizational weaknesses such as confused lines of authority and responsibility, duplication of functions, inefficient allocation of personnel, excessive span of control, and lack of intermediate supervisory levels.

The method of constructing organization charts is well known. A supervisor should not rely on existing organization charts without first reviewing them to be sure they reflect the actual organization and not a remote individual's conception of what the organization should be.

TASK LIST		DIVISION _____
		DEPARTMENT <u>Personnel</u>
		TITLE <u>Clerk-Typist</u>
NAME <u>Wilma Jackson</u>		
TASK NUMBER	DUTIES	HOURS PER WEEK
1	Wait on counter	8
2	Check old employee file	2
3	Stamp in Requisitions	1
4	Type fingerprint forms	3
5	Operate PBX	15
6	Handle Pxxx xxxxxxxx xxx	10
7	Xxxxxxxxx xxx XXxxxx xxx	15
TOTAL HOURS PER WEEK		40

ACTIVITY LIST -- PERSONNEL DEPT.	
1.	Solicitation and recruitment of applicants.
2.	Processing personnel requisitions.
3.	Examining applicants.
4.	Maintaining eligible lists.
5.	Giving promotional examinations.
6.	Answering inquiries.
7.	Handling xxxxx Xxxxxxx Xxxxxxxxxxxxx.
8.	Xxxxxxxxx xxxxx x xxxxxxx xxxxx.
X.	Xxxxx xxx XXxxxxxx xx Xxxxxxxxxxxxx.

WORK DISTRIBUTION CHART

ACTIVITY	TOTAL MAN-HOURS	Wilma Jackson Clerk-Typist	Man-Hours	Jack Woody Personnel Assistant	Man-Hours	M. Melody Principal Clerk	Man-Hours	M. Dickson Clerk-Typist	Man-Hours	Daisy Hahn Clerk-Typist	Man-Hours	Mrs. Stern (Record Room) Principal Clerk	Man-Hours
Solicitation and Recruitment of Applicants	39	Wait on counter Check old employee file	8 2	Write want ads Wait on counter Check old employee file	1 8 2	Write want ads	2	Type want ads Wait on counter Check old employee files	1 1 3	Wait on counter Check old employee files	7 3		
Processing Requisitions	32	Stamp in Requisition	1	Check Requisition Keep Requisition Register Maintain Suspense File	2 2 2	Check Requisition Allocate Keep Requisition Register Certification	2 10 2 5	Assist Miss Melody	3	Assist Miss Melody	3		
Examining Applicants	1					Make request for needed examination to provide names for certification	1						
Fingerprinting New Employees	16	Type Fingerprint forms	3	Fingerprint new employees Maintain fingerprint files	10 2					Type fingerprint forms	1		
Giving Promotional Examinations	1					Request needed promotional examinations	1						
Maintaining Eligible Lists	21					Supervise maintenance of Eligible and Promotional Lists	8	Maintain Eligible and Promotional Lists	7	Maintain Eligible and Promotional Lists	6		
Answering Inquiries	32	Operate PBX	15	Answer inquiries	5	Answer phone, letter, and personal inquiries	2	Answer inquiries	2	Answer inquiries Relieve on PBX	2		
	240		40		40		40		40		40		

SUMMARY

	PRESENT		PROPOSED		DIFFERENCE	
	NO.	TIME	NO.	TIME	NO.	TIME
<input type="radio"/> OPERATIONS	11					
<input checked="" type="radio"/> TRANSPORTATIONS	7					
<input type="radio"/> INSPECTIONS	1					
<input type="radio"/> DELAYS	3					
<input type="radio"/> STORAGES	0					
DISTANCE TRAVELLED	995	FT.		FT.		FT.

PROCESS ANALYSIS CHART

JOB PROCESSING PERSONAL PROPERTY TAXASSESSMENTS (SWORN STATEMENTS)☐ MAN OR ☒ MATERIAL ASSESSMENT FORMCHART BEGINS MAIL RECEIVEDCHART ENDS IBM SECTIONCHARTED BY G. W. WATT DATE 1-15-53

DETAILS OF (PRESENT) METHOD

	OPERATION	TRANSPORT	INSPECTION	DELAY	STORAGE	DISTANCE IN FEET	QUANTITY	TIME	ANALYSIS WHY?				NOTES	ELIMINATE	COMBINE	SEQUENCE	PLACE	PERSON	ACTION
									WHAT?	WHERE?	WHEN?	HOW?							
1 MAIL RECEIVED IN BAGS IN ASSESSOR'S OFFICE	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								AVERAGE OF 3600 FORMS / DAY.						
2 OPENED BY MAIL OPENER	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								1 CLERK						
3 REMOVED FROM ENVELOPE	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
4 UNFOLDED AND PLACED IN HOD	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
5 WAITS	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
6 TO ADDRESSOGRAPH SECTION	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	225													
7 DATE STAMPED AND COUNTED	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								ON ADDRESSOGRAPH						
8 WAITS	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
9 TO TABULATING SECTION	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	200													
10 WAITS	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
11 SORTED - CHANGES SEPARATED	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								1 PERSON CHANGES HELD OUT						
12 TO PRICER	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30													
13 MOTOR VEHICLE ASSESSMENT ENTERED AND TOTALLED	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								1 PERSON PLUS PART-TIME HELP						
14 TO ALPHABETIZER	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	35							THOSE SHOWING NO ASSESSMENT REMOVED AND HELD FOR BOARD RAISE						
15 ALPHABETIZED	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								1 PERSON						
16 TO CHECKING CLERKS	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15							3 PERSONS						
17 MATCHING FILE COPY PULLED FROM FILE	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
18 MOTOR VEHICLE VALUATION CHECKED	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								THOSE SHOWING LOWER M.V. VALUE REMOVED AND HELD FOR BOARD RAISE.						
19 MATCHING OFFICE COPIES DESTROYED	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
20 TO SUPERVISOR	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10													
21 BATCHED	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>														
22 TO IBM SECTION	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	480	3900						IN 100'S						
23	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								DAILY						

The process chart. Before the supervisor can properly evaluate a complete procedure, he must record the procedure step-by-step in detail, separating the complete job into its basic elements. He may do this mentally, or he may use a process chart to insure recording all the steps. The process chart (see illustration) is prepared either by following materials, such as paper forms, through the entire procedure, or by recording the activities of employees as they perform a routine activity, such as refuse collection.

The process chart traces and highlights work flow from employee to employee, dividing the procedures into their simple, individual details; it indicates clearly the preparatory, productive, and clean-up phases of the job; it results in a picture which separates the job from its background and surroundings; and its condensed form enables the procedure to be visualized in its entirety. Finally, the close observation required to prepare the chart assists the supervisor in developing means of making improvements. Frank Gilbreth, who devised the process chart, said that it was not only the first step in visualizing a better way to do work, but was also useful in every phase of the analysis, even if existing conditions were apparently satisfactory.

Briefly stated, the steps in making a process chart are:

a. Deciding on the activity to be charted and making sure the job being analyzed is really the one intended.

b. Selecting a starting point and an ending point. One person, item of material, or paper form should be followed throughout, to the exclusion of all others.

c. Describing each step, no matter how minor. When a step is doubtful, it should be included and each step should be given a number. A satisfactory process chart can be made only by actually following the item or person charted from start to finish.

d. Applying the proper symbol and connecting it with the previous one. On construction of process charts see the manual of the U. S. Budget Bureau listed in the bibliography.

The layout-flow diagram. The process chart is usually supplemented with a layout-flow diagram. This is a sketch of the working area showing the route of the item which is followed on the process chart. The layout-flow diagram is an added help in visualizing the procedure. By showing only travel and ignoring what happens to the item as it is moved from place to place, it may reveal unnecessarily long transportations and backtracking.

4. Analyzing and Improving the Procedure

After the facts have been gathered and organized in chart form, the supervisor is ready to proceed with the fourth step, analysis. Analysis is essentially a process of challenging the details of the present procedure.

Analysis of the work distribution chart. The work distribution chart, showing all the activities of a unit rather than details of any particular activity, provides the first check on the sufficiency and necessity of the work being done. Close study of each activity should reveal evidence of any misdirected effort -- too much time spent on relatively unimportant tasks; more checking done than is justified by normal or anticipated error; uneven work distribution.

Next, the supervisor should review the work of each employee to evaluate the proportion of time spent on each function. He will relate these figures to what he knows about the employee. Are skills being utilized properly? Is the employee working above or below his ability; is he doing the job he can do best; is he doing too many unrelated tasks? (Tasks which differ frequently and widely result in waste motion, excessive fatigue, and "change-over time loss.") Are tasks spread too thin? Too many employees contributing to a single activity results in bottlenecks, interruption, inconsistent quality, and buck-passing.

Analysis of work distribution in this way will quite possibly turn up ideas for combining, changing, or eliminating work assignments that will achieve more efficient and economical operations. It should also contribute the leads for determining which phase of the job can be most productively subjected to further work simplification analysis.

If the operation has survived the previous tests, then an effort should be made to improve it or to simplify it. Simplification of individual operations usually is based on rearrangement of the work area to reduce waste motion, use of charts or equipment to eliminate mental calculation or hand labor, comparison of methods used by different employees performing similar tasks to determine the fastest or easiest way, and utilization of improvements developed in other studies.

Analysis of the process chart. Every step in the whole job should be challenged, with the process chart as a guide. Why is it done? Is it necessary? What is the worst that can happen if it is not done or if a record or report is not used at all? Next, the "do" operations should be challenged. If these can be eliminated, many make-ready and put-away operations which are dependent upon the "do" may also be eliminated. Finally, each step of the procedure should be challenged again, using the "Big Six": why, what, where, when, who and how. In the analysis, why is the key, for it reveals the reasoning behind the present method and may point the way to a new method. To assist in interpretation of the process chart, officials might use a standard guide such as those listed in the bibliography at the end of this report.

5. Preparing Recommendations and Getting Approval

When an existing procedure is made the subject of detailed study and analysis for the first time, improvements are almost certain to be uncovered. These should be reviewed and discussed by those in authority, to establish their feasibility, iron out difficulties, and pave the way for adoption. Ultimate action on these improvements may depend on the authority of the person uncovering them. If he has authority to require action, he quite possibly will do so without delay. If not, he will have to prepare convincing arguments - for his supervisor, if an employee; for both employees and his own superiors, if a supervisor, and for the council if a policy question is involved.

When a staff agent or an outside consultant is used, he must establish a reputation for making recommendations that are realistic, workable, and economical, and that account for human equations. He should prepare straightforward reports that separate the sound from the impractical and largely dismiss the unsound without argument. Recommendations should be clearly and attractively presented. Brevity will be a notable virtue, and process charts of the "before-and-after" type will be helpful.

Presentation of staff or consultant recommendations should be made in a meeting where they may be discussed, questioned, and examined by those who will be responsible for successful operation of the new system. In a small city such a formal presentation may be unnecessary, but thorough communication and evidence that the new method will be, in fact, better are still essential if department heads and others are to be convinced of the desirability of the proposed changes. Otherwise, the improvements may fail from sabotage or lack of support.

6. Installation, Follow-up, and Adjustment

Once the recommendations are understood and accepted by all persons concerned, detailed instructions and forms should be prepared. The supervisor should next call a meeting of his associates to prepare for the changeover. If a consultant was engaged he should attend this meeting but he should participate only when called upon by the supervisor. This meeting will assure the consultant that the supervisor understands the new method thoroughly and is prepared to supervise its operation.

There are generally four methods for installing a new procedure: (a) partial, where only a part of the complete procedure is installed at one time; (b) pilot, where the complete procedure is established on a trial basis in one small unit of the organization; (c) simultaneous, where the new method is installed while the old method is maintained and is operated concurrently; and (d) instantaneous, the generally preferred method where the new procedure is installed to replace the old in its entirety.

Which of these methods is selected will depend on complexity of the change, readiness of the personnel to accept it, availability of forms, material, or equipment, and certainty that the proposed changes will effect the improvements estimated. For instance, a change from hand to machine billing of water accounts may be proposed, with billing on a quarterly instead of a monthly basis. If the machine is not immediately available and the operator will require some training, there can still be considerable saving in manpower and mail costs by changing immediately to the quarterly billing basis while carrying on the method of hand billing until the machine is delivered and the operator is thoroughly acquainted with it.

A pilot project might deal with changes in collection of garbage where the new method is started on a single route for a time long enough to determine its effectiveness and economy, to solve scheduling problems, and to plan for training personnel on the other routes in the new method.

Few new procedures can be planned perfectly in advance and on paper. Personnel involved in a procedure which is to be modified should be trained for their new tasks, and once the installation is made they should be supervised closely, not only to correct difficulties that may appear but also to determine further possible refinements. An installation that is carefully planned and reviewed, with proper provision for training and retraining and with operation by employees who have been thoroughly prepared for the change, will require a minimum of adjustment once it has "shaken down" and employees have accustomed themselves to the new routine.

In any case, as modifications appear desirable the supervisor should follow substantially the same steps as were involved in improving the original procedure--defining the objective, preparing his people by consultation, gathering and

organizing the additional facts, analyzing them, and getting the necessary approvals. These steps need not be as formal or detailed as the original study; but they should be developed fully enough to insure that no further modifications will be needed once the final changes have been made.

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